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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

TICKET AGENT (air trans.) 1-44.12

B-472

or

S-200

U. S. Employment Service in
Cooperation with
New York State Employment Service

September 1962

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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

TICKET AGENT 1-44.12

B-472 or S-200

Summary

The General Aptitude Test Battery, B-1002A was administered to a sample of 34 men and 21 women employed as Ticket Agents, 1-44.12, at various locations, by Nohawk Airlines. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes G, V, and N with minimum scores of 95, 105, and 90, respectively, are recommended as B-1002 norms for the occupation of Ticket Agent, 1-44.12.

GATB Norms for Ticket Agent, 1-44.12 B-472 or S-200

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Ticket Agent, 1-44.12.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-472 or S-200

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-I CB-1-J CB-1-K	100	G	Part 3 Part 4 Part 6	95
V	CB-1-J	105	V	Part 4	105
N	CB-1-D CB-1-I	95	N	Part 2 Part 6	90

Effectiveness of Norms

The data in Table V indicate that 14 of the 18 poor workers, or 78 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 78 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 28 of the 32 workers who made qualifying test scores, or 88 percent, were good workers.

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Ticket Agent 1-44.12.

II. Sample

The General Aptitude Test Battery, B-1002A, was administered during the summer and fall months of 1958 to a sample of 62 men and 46 women employed as Ticket Agent, 1-44.12 by Mohawk Airlines Utica, New York. Due to the absence of criterion data, the final sample was reduced to 55; 34 males and 21 female. No formal criteria were used to select the members of the final sample for employment; previous experience is not required but a high school education is desired.

Table II shows the means, standard deviations, ranges, and Pearson product-moment correlations with the criterion for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r), and the Standard Errors of Correlation (σ_r) for Age, Education, and Experience

N = 55

	M	σ	Range	r	σ_r
Age (years)	25.6	4.6	18-36	.141	.132
Education (years)	12.3	1.0	10-16	.035	.135
Experience (months)	28.0	20.6	1-90	.323*	.121

*Significant at the .05 level

Table II indicates that there is a very low and insignificant relationship between age and length of education with the criterion. The relationship between length of experience and the criterion is also relatively low, but statistically significant. Rather than correct the criterion for the experience effect that might be present, it was decided to determine first the extent to which it might, in turn, affect other results by employing the technique of Partial Correlation. Of Course, we are here primarily interested in relationships between the criterion and the aptitude factors of the GATB. Since the Partial Correlations were not essentially different from the uncorrected correlations it was felt that no advantage would be gained by correcting the criterion for experience.

III. Job Description

Job Title: Ticket Agent (air trans.) 1-44.12

Job Summary: Answers inquiries regarding airplane schedules, describes routes, services and accommodations available, reserves space and sells tickets for scheduled flights at an airline terminal station or a ticket counter.

Work Performed: Gives passenger information and makes reservations for space: Answers inquiries received by telephone or in person, regarding scheduled flights available, departure and arrival times, fares, possible itineraries, baggage allowances and restrictions, check-in and reservation requirements, etc. Refers to Tariff Schedules, Official Airlines Guide, Traffic and Sales Manual, Operations Manual, and Standard Interline Passenger Procedures whenever needed information cannot be supplied from own knowledge. Receives requests for reservations by telephone or in person. Advises caller concerning times of flight, departures and arrivals and possible itineraries, referring to flight schedules in Airline Guide if necessary. Refers to space control book and confirms space if available. Records name, telephone number, and destination on reservation space chart. When space is not available, enters passenger's name on waiting list, if desired. Notifies all stations by teletype whenever a flight has been completely reserved. When space on other airlines is needed, prepares and sends request on teletypewriter, using standard codes and abbreviations. Notifies passenger by telephone when space confirmation is received. Receives teletyped requests for space from other stations, checks space control chart, and advises requesting station by teletype as to availability of space. Marks reservation on chart sheet for date and flight designated.

Sells airline tickets: Questions passenger to determine ticketing needs. Checks reservations and space control records to note seats for flight which remain unsold. May refer to Tariff Schedule for information concerning routing and fares. Prepares ticket by recording on it passenger's name, flight numbers, amount of fare and tax, destination, departure and arrival times.

Receives payment and makes change; or when passenger presents credit card, records identifying information, ticket number, itinerary, fare and tax, and obtains passenger's signature on the form. When issuing ticket on wire or exchange order from another airline or on government order. Staples authorization or transportation request to auditor's copy. Records space sold on space control chart by drawing a line opposite open seat number between stations of travel.

Checks in passengers for flight: Checks passenger's ticket coupon against passenger listing for flight, pulls flight coupon from ticket, and records destination on flight manifest. Weighs and tags baggage, entering weight and number of pieces on flight manifest. Staples baggage claim check to ticket envelope, inserts ticket in envelope, marks flight number and destination on envelope and hands it to passenger. Gives passenger any pertinent information such as expected delay in flight, need for confirmation of continuing space, etc. Tickets stand-bys, subject to appearance of reserved passengers.

Performs incidental duties: When starting work on morning shift, opens safe, removes cash-box and counts money to see that required sum has been left in box by agent on previous shift; distributes cash in drawer at ticket counter. Prepares ticket report by listing form number of each ticket sold during shift, amount of fare and tax, how paid for; counts and balances cash. Prepares daily No-Show Report by listing names and ticket numbers of passengers failing to appear. Marks flight changes with crayon on arrivals-and-departure board, and changes flight number cards on check-in signs over counter, designating next flight to be checked-in. May announce plane arrivals and departures, and page passengers on a public address system.

IV. Experimental Battery

All of the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The final criterion was a composite of the ratings for each worker made by the Station Manager on a rating scale and the rank for each worker in the Station Manager's overall ranking of individuals he supervised. The rating scale consisted of six items, each covering an important aspect of the job duties. Each item had seven statements regarding the degree of adequacy of performance. The final criterion scores had a range of 34-88, a mean of 63.1 and a standard deviation of 14.0.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation.

Intelligence (G) - required in acquiring and retaining working knowledge of all company and tariff rules and procedures; to exercise judgement in helping passengers plan itineraries.

Numerical Aptitude (N) - required in figuring fares and taxes.

Form Perception (Q) - required in reading tariff schedules, Airline Guide, manuals and similar publications and in making out tickets, flight manifests etc.

On the basis of the job analysis data, none of the aptitudes were considered obviously unimportant for performing the duties of this job. Therefore, there were no "irrelevant" aptitudes.

B. Quantitative Analysis:

Table III shows the means, standard deviations, and Pearson product-moment correlations with the criterion for the aptitudes of the GATB. The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), and Pearson Product-moment Correlations with the Criterion (r), Partial Correlations (for experience) with the Criterion (r'), and Standard Errors of Correlation (σ_r) for the Aptitudes of the GATB.

Aptitudes	M	σ	r	r'	σ_r
G-Intelligence	107.7	14.4	.420**	.428**	.111
V-Verbal Aptitude	108.0	15.4	.476**	.462**	.104
N-Numerical Aptitude	106.7	12.4	.189	.221	.130
S-Spatial Aptitude	105.1	20.3	.277*	.303*	.124
P-Form Perception	108.8	17.7	.023	.058	.135
Q-Clerical Perception	114.6	11.9	.096	.175	.134
K-Motor Coordination	115.9	14.7	-.248	-.203	.127
F-Finger Dexterity	108.9	20.3	-.060	-.022	.134
M-Manual Dexterity	125.4	21.2	-.002	-.003	.135

**Significant at the .01 level
*Significant at the .05 level

Aptitudes Q, K, and M have the highest mean scores and aptitudes G, N, Q, and K have relatively low standard deviations. For a sample of 55 cases, correlations of .345 and .266 are significant at the .01 level and the .05 level of confidence, respectively. Aptitudes G and V correlate significantly with the criterion at the .01 level. Aptitude S correlates significantly with the criterion at the .05 level. (These data indicate that there is no advantage in correcting the criterion for experience.)

C. Selection of Test Norms

TABLE IV

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X		X			X			
Irrelevant									
Relatively High Mean						X	X		X
Relatively Low Sigma	X		X			X	X		
Significant Correlation with Criterion	X	X		X					
Aptitudes to be considered for trial norms	G	V	N	S		Q	K		

Trial norms consisting of various combinations of Aptitudes G, V, N, S, Q, and K with appropriate cutting scores were evaluated against the criterion by means of the tetrachoric correlation technique. A comparison of the results showed that B-1002 norms consisting of G-95, V-105, and N-90 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 58 was used and resulted in 18 of the workers or 33 percent of the sample being placed in the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes G, V, and N with critical scores of 95, 105 and 90 respectively, and the dichotomized criterion for Ticket Agent; 1-44.12. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V

Validity of Test Norms for Ticket Agent, 1-44.12

(G-95, V-105, N-90)

N = 55

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	9	28	37
Poor Workers	14	4	18
Total	23	32	55

$r_{tet} = .74$ $\quad \chi^2 = 12.108$

$\sigma_{r_{tet}} = .22$ $\quad P/2 = < .0005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, V, and N with minimum scores of 95, 105 and 90 respectively, have been established as B-1002 norms for the occupation of Ticket Agent, 1-44.12. The equivalent B-1001 norms consist of G-100, V-105 and N-95.

IX. Determination of Occupational Aptitude Pattern

The relationship between OAP-7 of the existing 35 OAP's and the criterion for the experimental sample was not significant. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.